

Ibn Khaldun Fellowship Seminar Series



Ibn Khaldun Fellowship
for Saudi Arabian Women

“Exploring textured carbonaceous microparticles as electrocatalysts for vanadium redox flow batteries”

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Zoom Webinar: <https://mit.zoom.us/j/98230191220>



Research Topic: Redox flow batteries (RFBs) hold promise for large-scale energy storage applications due to their independent energy and power scaling, geographical insensitivity, and long cycle life. However, further reductions in system costs are needed for commercial viability. The introduction of electrocatalysts into the porous carbon fiber-based electrodes common to RFBs presents an opportunity for performance enhancement and, consequently, cost reduction. Of interest is the applicability of high surface area graphene which is anticipated to promote ionic adsorption and to improve the electrode performance of a range of redox reactions. In this presentation, we will describe our approach to synthesizing carbon-based electrocatalysts and their performance within redox flow cells. Of interest we will discuss the relative importance of different processing steps (i.e., oxidation, reduction, drying) in the graphene synthesis which control the surface area and pore structure of the resultant powder. The performance and durability of the carbon-based materials deposited into electrodes will be discussed as a function of redox chemistry and cell operating conditions. We anticipate that the strategies described in this presentation are broadly applicable to RFBs and other liquid-phase electrochemical systems.

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